

REMARKS/ARGUMENTS

This is a response to the Office Action dated April 24, 2009. Claim 3 has been amended. Upon entry of this amendment, claims 1-17 and 19-20 will be pending in the present application.

Claim 3 has been amended to require that the mirrors be repositioned to reflect a different set of pixels representing different locations of a scene. Basis for this amendment may be found, for example, at page 6, lines 24-33 and page 7, line 1 of the specification as originally filed.

In view of the following remarks, Applicant respectfully requests favorable consideration, withdrawal of the rejections and issuance of a Notice of Allowance.

1. *Allowed Claims*

Applicant wishes to thank the Examiner for indicating the allowance of claims 1-2 and 4-12.

2. *Claim Objection*

Claim 3 has been objected to for lack of antecedent basis. Claim 3 has now been amended to provide adequate antecedent basis.

3. *The Prior Art Rejections*

Claims 3, 13-17 and 19-20 have been rejected, pursuant to 35 U.S.C. §103(a), as being obvious over U.S. Patent No. 5,212,555 (Stoltz). This rejection is respectfully traversed, and reconsideration is requested for the reasons which follow.

Stoltz discloses an imaging system including a deformable mirror device (DMD) 11 having a plurality of mirror elements 41 that reflect light from an object. Optical sensors 15 are required to receive and convert the reflected light to electrical energy. While the mirror elements 41 are movable by a torsion beam, cantilever supports or elastomer/membrane designs, they are only designed to assume two positions: an "on position" wherein light is directed towards a sensor and an "off position" wherein light is directed away from the sensor (See Stoltz col. 3, lines 45-51, 65-68; col. 4, lines 1-4). In operation, sensor 15 detects light reflected from each of the mirror elements 41 one mirror at a time in a predetermined sequence until all the pixels of an image frame have been analyzed (See Stoltz col. 4, lines 65-68; col. 5, lines 1-2). Each mirror element 41

reflects only one designated pixel of a particular image (See Stoltz col. 4, lines 61-64). Nowhere does Stoltz teach reorienting mirror elements 41 to reflect more than one pixel of an image.

By contrast, Applicant's imaging method involves supplying a micromirror array having a plurality of micromirrors, wherein each micromirror may be positioned in a plurality of positions to enable each mirror to reflect at least two different sets of pixels of a particular image (See Application Figs. 1(a)-1(b)). This ability of each of the micromirrors to reflect more than one set of pixels of a particular image increases image resolution without requiring a corresponding increase in the number of micromirrors or sensors, as would be the case in the Stoltz imaging system. (See application page 6, lines 27-33; page 7, line 1).

With respect to independent claim 3, Stoltz fails to disclose all the requisite claim elements. Namely, Stoltz fails to disclose:

1. repositioning the mirrors of the micromirror array to reflect a different set of pixels representing different locations of a scene; and
2. assembling the extracted color values of each reflected pixel, including the different set of pixels, into an image.

The Examiner asserts that Stoltz teaches repeating steps a and b a sufficient number of times to provide an image of a desired resolution. Applicant respectfully submits that a single mirror element 41 of Stoltz is incapable of reflecting different sets of pixels of an image and that Stoltz also does not disclose assembling the extracted color values reflected from each of the different sets of pixels reflected by the micromirror. Rather, mirror element 41 is designed to reflect only one corresponding designated pixel, and each set of mirrors are only designed to reflect a specific corresponding set of designated pixels (See Stoltz col. 4, lines 61-64). The archaic mirror elements 41 of Stoltz's DMD 11 are simple binary structures designed to assume two possible positions: an "on position" wherein light is directed towards a sensor 15 to reflect a single pixel of an image and an "off position" wherein light is directed away from the sensor 15 and no reflection of the image is transmitted to sensor 15 (See Stoltz col. 3, lines 45-51, lines 65-68; col. 4, lines 1-4). Because each of Stoltz's mirror elements 41 is restricted to reflecting a single designated pixel and only has 2 positional states, i.e. an on position and off position, the mirror elements of Stoltz are not capable of reflecting more than one set of pixels of a scene, as required by claim 3. Furthermore, Stoltz does not disclose assembling the extracted color values of each set of the reflected pixels, including the different set of pixels, reflected by the same micromirror.

Relying on Stoltz's statement that "[i]f it takes 10×10^{-6} seconds to address a pixel element of DMD 11, and the image resolution is to be 160x120 pixels, it would take $10 \times 10^{-6} \times 160 \times 120$ seconds to sense an entire image frame." (See Stoltz, col. 5, lines 40-45) the Examiner argues that repetition of steps a and b is inherently disclosed by the achievement of a 160x120 resolution. It appears that the Examiner rationalizes that the resolution of 160x120 can only be achieved by enabling the mirror elements to reflect multiple or different sets of pixels. Applicant respectfully disagrees. Inherency can only be established when the allegedly inherent feature would necessarily flow from the teachings of the prior art reference. According to MPEP §2112,

"The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) ... "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.' " *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999)

"In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)"

Reflecting different sets of pixels with each micromirror in the micromirror array and assembling the extracted color values of each reflected pixel, including the different set of pixels, into an image is not necessary for and does not necessarily flow from the statement in Stoltz that the image resolution is 160x120. A close reading of Stoltz makes it clear that this resolution may be achieved by using a micromirror array having 160 mirror elements by 120 mirror elements. Stoltz explains that DMD 11 may be a micromirror array having any size to achieve the necessary resolution; for example, DMD 11 may be a 640x480 micromirror array that produces an image with a 640x480 resolution (See col. 4, lines 13-22). The 160x120 resolution therefore does not necessarily imply that a micromirror is used to reflect more than one pixel.

This is confirmed by Stoltz's disclosure that if it takes 10×10^{-6} seconds to address a pixel element of DMD 11, and the image resolution is to be 160x120 pixels, it would take

$10 \times 10^{-6} \times 160 \times 120$ seconds to sense an entire image frame. This statement makes it clear that there are 160×120 pixels used in the apparatus to provide the 160×120 resolution since Stoltz is multiplying the amount of time per pixel times the total number of pixels to determine the total pixel scanning time. In view of the foregoing explanation, Applicant therefore respectfully asserts that Stoltz does not inherently disclose reflecting different sets of pixels using a single micromirror or assembling the extracted color values of each reflected pixel, including the different set of pixels, into an image. Furthermore, the Examiner has previously indicated that claims 1-2 and 4-12 are allowable for similar reasons, noting that the prior art does not teach "reflect[ing] different sets of pixels representing locations of the scene" (See Office Action, page 4).

According to MPEP §2181, the Federal Circuit recognizes that the Examiner bears the initial burden of proof to demonstrate that Stoltz inherently discloses the claimed invention. Applicant respectfully submits that in view of the above arguments, this burden has not been met. For the reasons presented above, Stoltz fails to disclose all the elements required by independent claim 3. Consequently, Stoltz also fails to render obvious claim 3 and any claims that depend therefrom. Favorable consideration, withdrawal of the rejections and issuance of a Notice of Allowance is requested.

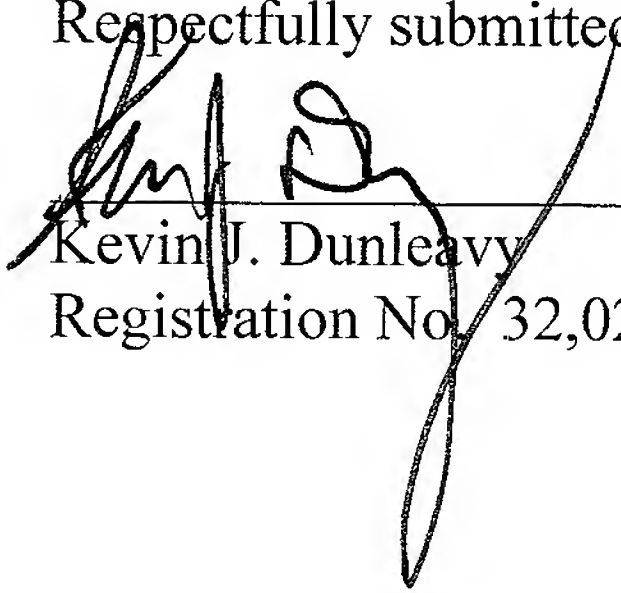
4. *Conclusion*

Applicant has made an earnest effort to place this application in condition for allowance. If the Examiner feels that a telephone interview would expedite prosecution of this patent application, he is respectfully invited to telephone the undersigned at 215-599-0600.

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